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Butzow Bridge
Carrying County Highway 35
Over Spring Creek
Vicinity of Crescent City
Iroquois Township
Iroquois County
Illinois

HAER No. IL-124

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

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HISTORIC AMERICAN ENGINEERING RECORD
BUTZOW BRIDGE
HAER No. IL-124

I. INTRODUCTION

Present Location:	Iroquois County Highway 35 Spanning Spring Creek Three miles north and two miles east of Crescent City, Illinois
USGS Quadrangle:	Crescent City, Illinois Latitude 40°-48.75'; Longitude 87°-49.73' UTM 16.430080.4518160
Inventory Data:	County Highway 35 Butzow Bridge Illinois Structure No. 038-4202 NE 1/4 of Sec 21, T27N, R13W Iroquois County
Date of Construction:	1883, Bridge Name Plate, County records
Owner, Custodian:	Iroquois County Highway Department
Present Use:	Vehicular bridge programmed for replacement in 1995.
Significance:	This two-span bridge, located at a historic crossing on Spring Creek, includes a 119' Through Pratt truss, the oldest known through truss in Illinois, an early example built by the Smith Bridge Company, one of two known spans in the state to have been built by this prolific Toledo, Ohio, builder. Pin-connected Pratts were a common late 19th and early 20th century metal truss design which is vanishing from the American landscape.
Historian:	John B. Nolan, S.E. 21 June 1995

II. HISTORY

Spring Creek, a large tributary of the Iroquois River in northeast Illinois, flows generally northeasterly through the westward half of Iroquois County to join the Iroquois River a half mile above the Butzow Bridge. The surrounding flat plain, in ancient times the vast Kankakee swamp basin, a "wet prairie" with considerable timber, has been drained and is extensively cultivated. A few artesian wells, formerly abundant, continue to flow. The streams, which meander northerly to the Kankakee River, are broad and sluggish, significant barriers to early settlers.[1]

The earliest Euro-Americans to remain in the Spring Creek area arrived in 1835. A short time later Henry A. Butzow, an emigrant from Germany, "undertook to make a farm" at the mouth of the creek. From an Indian trading post at the mouth of Spring Creek a trail led to Watseka, then called Middleport, four miles to the south. Before the Butzow bridge was built, traffic between Watseka and Kankakee crossed to the east side of the Iroquois River at Fiddler's Ferry, about 1.6 miles east of the present bridge site, then recrossed at Plato, five miles to the north, to join the Indian Butterfield trail between Danville and Kankakee. The Indian trail followed the high ground west of Spring Creek and the Iroquois River.[2]

Butzow, in addition to farming in the vicinity, acquired other properties in the county. After serving three and a half years in the Civil War he returned to Germany for a wife. Following the birth of his seven children the family relocated to Watseka where he served in several township offices. In 1873 he was elected county clerk, in which office "he served in a neat and business-like manner". Several of his descendants live in the area, one on the site of the original cabin near the bridge.[3]

A bridge over Spring Creek would provide a direct route between Watseka and Kankakee along the west bank of the Iroquois, bypassing two ferries. At a meeting in September 1882, the Road and Bridge Committee of the Iroquois County Board of Supervisors reported that Iroquois Town (township) did not have sufficient funds for an iron bridge over Spring Creek "intersecting the highway leading from Watseka to Kankakee", and that bonds would be sold to obtain the $1250 required for the bridge. Although the committee protested that the township's request was not in order, the motion to build the bridge was passed by the Board.[4]

On July 10, 1883, the special committee appointed to work with the county in "the building of an iron bridge across Spring Creek on what is known as the Kankakee Road" reported that the contract had been let, and on April 28th they had examined the stone hauled and the trenches dug out for the foundation. On May 23rd the stone abutments were examined and on July 7th the bridge work had been finished. The committee chairman, E. Hitchcock, reported, "..your committee was satisfied that both the iron and stone work are of good material and

built in a solid and substantial manner; and that an honest job had been done and the contract had been fully complied with."

The Board accepted the report and ordered that the Smith Bridge Company of Ohio be paid $2808. J. Matsonbaugh was paid $2845 for the erection of stone abutments for the Spring Creek Bridge and a smaller structure. Chairman Hitchcock was paid $7.50 for his services on the committee.[5]

Although the direct Watseka-Kankakee route crossing the bridge is included on Mendenhall's Bicycle Route map, issued in 1902, the road has never been incorporated into the state or federal systems. In 1917, before the adoption of state route numbers, entrepreneurs marked the Dixie Trail, connecting Danville and Chicago, as continuing directly north from Watseka. The Egyptian Trail, on the west side of the county paralleled the Illinois Central Railroad from Champaign to Kankakee. To this day no state maintained route provides direct access between these two county seats.[6]

The riding surface of County Highway 35 is narrow but smooth. A lack of roadway shoulders and sharp curves at the present bridge approaches limit traffic to 35 mph. A revised alignment, now under construction for the replacement structure, will eliminate the tight right angle turn at the west end of the structure.

III. THE BRIDGE

A. The Bridge Type

The main span of the Butzow bridge is a simple span Through Pratt truss, a type of truss favored by bridge designers in the closing years of the 19th century. The bridge crosses Spring Creek at right angles.

The development of trusses of wrought iron in the first half of the nineteenth century and, later, steel in the second half, contributed to the rapid expansion of railroads, settlement and industrialization of a growing America. Pratt trusses with pinned connections were the practical and cost effective bridge type. Members of early trusses were assembled with rivets in one of the hundreds of small fabrication shops, transported to the site by railroads and wagons and erected by a crew of local laborers under the direction of a foreman from the manufacturer's company. There were few standards, and many companies developed and patented designs which allowed them to build unique, if not better, bridges.[7]

By the turn of the century, national quality standards were being developed and many smaller bridge companies ceased operations or merged into larger companies, principally the American Bridge Company. A report of the first Illinois Road Commission in 1906 urged uniformity in design and the development of experienced contractors.[8]

The early lightweight Pratts with pinned connections were simple to erect but lacked strength and lateral stability. Many were washed out, failed or were replaced as highways were improved and traffic weights increased following World War I.

Characteristic ornamentation of the period are the decorative peaked globe finials mounted on the bridge posts. Above the bridge portals are cast manufacturer's plates with ornamental trefoil caps and scrolled supporting brackets at the lower corners.

SMITH BRIDGE Co.
1883
Toledo, O.

Light bracing, lack of sway frames and knee bracing at the upper chord level are indications of an early truss designed with no provisions for transverse wind loads.

The Butzow is one of the few remaining trusses in Illinois which were designed, fabricated and built by independent bridge companies. Good maintenance and light traffic has enabled this anachronism of early bridge engineering to survive for 112 years.

B. The Manufacturer

The Smith Bridge Company

In 1867 Robert W. Smith opened his first company in Tippecanoe City (later Tipp City), Ohio, to build his patented wooden bridges. He moved to Toledo in 1869 and in 1870 founded the Smith Bridge Company. The new company built hundreds of dependable wooden trusses, as well as composite trusses, wrought iron trusses, and later numerous steel bridges.[9] J.F. Zwilling, who began his career as foreman of the Smith Company blacksmith shop when combination wood and iron bridges were constructed, became superintendent of the plant when the firm began making iron bridges. Smith sold the company in 1890 and the new owner changed the name to Toledo Bridge Company. In 1901 it was incorporated into the American Bridge Company at which time the Toledo Bridge Company had 650 employees and an annual production of $2,500,000.[10]

One other structure in Illinois is known to have been built by the Smith Bridge Company. The Tiskilwa Bridge (006-4000), in Bureau County over Bureau Creek, built in 1884, a through Pratt truss, 120'-0" long, with 8 panels at 15'-0", incorporates the corner urns, a similar name plate and many of the fabrication details used in this bridge. The Tiskilwa Bridge is being demolished as this report is prepared.[11]

C. Structure Description

For a schematic sketch of the Butzow truss see page 11.

Two Spans, total length about 140'.

1. West approach span, approximately 20' long, two-panel Warren pony truss with center vertical, modified when moved from earlier location, only east truss remains, west end of center floor beam supported by a concrete column; poor condition, lacks historical significance.

2. Main span, through Pratt truss; steel. Length 119'-0", seven (7) panels at 17'- 0". Distance center to center of trusses 15'-4". Clear width between trusses 14'-4". Height between upper and lower chord centerlines 19'-0". Clear height above the roadway at portal 15'-10"(10' width).

   Truss details are symmetrical about center of third panel.

   Inclined end posts and upper chords:
   Two channels 8"x1-3/4" with 12"x1/4" continuous top plate, batten plates 4"x3/16" at 3'-6" centers on bottom.

   Lower chords:
   L0-L1 two rods 1-1/2" dia., threaded at L0, loop at L1.
   L1-L2 two eye-bars 2" x 7/8"
   L2-L3, L3-L4 two eye-bars 3" x 1"

   Vertical Members:
   U1-L1 hip vertical, one rod 1-1/2" dia., loop ends
   U2-L2, U3-L3 intermediate posts, two channels 5"x1-1/2", webs parallel to roadway, o to o of toes 11-1/2", single lacing 1-1/2"x1/4" at 9" alternate centers each side.

   Diagonals and counters:
   U1-L2 main tie, two bars 3"x5/8", loop ends.
   U2-L3 main tie, two bars 2"x5/8", loop ends.
   L2-U3 counter, one rod 3/4" dia., 1" dia., upset threads, sleeve nuts 10-1/2", loop ends.
   U3-L4, L3-U4, counters, two rods 7/8" dia., upset threads, sleeve nuts, 1" dia., loop ends.

   Floor Beams:
   Fabricated, haunched plate girders, 10" deep at ends, approximately 2'-0" deep at center, single bearing web stiffeners under stringers.
   U-hangers, L1-L6, 1"x1", upset threads, end plate 4"x1/2" fits in guide angle castings shaped to fit sloping bottom flange of floor beam. Top of floor beam is 3-1/2" below lower chord pins.

Bottom lateral cross-bracing:
Rods approximately 7/8" dia., loop ends bent and bolted to floor beam web with single bolt connecting opposite rods, sleeve nuts.

Stringers (joists):
Two edge channels, 5 interior I beams, 8"x4", at 2'-6" centers

Pins:
Panel connections: 2-1/4" dia.

End bearings:
Two part cast block shoes without pins, arc end, approximately 12" dia. bears in convex socket, L0-L1 bars extend through socket casting, hex nuts.

Rivets: 3/4" dia. main members

Top lateral bracing:
Struts; I-beam 5"x2", 3-1/2" continuous coverplate riveted to top, end plates on bottom; attached to upper chord centerline at panel points without knee bracing.

Lateral cross bracing in each panel; rods, approximately 7/8" dia. with sleeve nuts; end loops bent and packed on U-joint connection pins.

Portals:
Sloping lattice assembly encompassed with paired 2"x2" angle frame, height on slope approximately 2'-2", integral knee bracing 2'-6"x2'-6" with 45° knee framing extending to top angles of portal. Top of frame is below U1 pin plates. Lattice appears to be 1-1/2"x1/4" bars intersecting and riveted in grid at 8-1/2" centers. Sides of frame bolted to web of end post channels.

Deck:
Nominal 3"x12" transverse lower timber decking; nominal 2"x10" longitudinal intermediate decking, full width, topped with 1/2" seal coat.

Rail:
Continuous channels 4"x1-1/2", toes away from roadway, 30" above the floor. Clamped to vertical truss members.

4. Substructure:

Original limestone masonry abutments have been replaced with pile bents, formed concrete caps on five treated timber piles.[13]

The original west abutment was replaced in 1960 with a pier bent. At that time the bank was sloped and an abutment bent added to support the salvaged and modified pony truss provided as a west approach span. Backwall and wingwalls are treated timber planking.

The east abutment was replaced in 1970 with a 5"x13" backwall on the bent cap. Lower backwall and wingwalls are treated timber piles and planking.

D. Present Condition And Modification

Maintenance has been remarkably good, a few missing or defective rivets have been replaced with bolts. The wearing surface and painting are in good condition. Generations of the Butzow family have kept the end bearing thrust blocks clean. There is no evidence of modification to the main span trusses and no distress areas were noted in the members during the inspection.

The bridge is posted for eight tons, single vehicle; fourteen tons for combination vehicles, and one truck at a time.

The Butzow Bridge is enviromentally friendly with minimal traffic and close, densely wooded banks on three corners. When the deck was clear during the inspection a coyote casually trotted across to the other side of Spring Creek.

E. Ownership and Future

The Butzow Bridge is owned and maintained by the Iroquois County Highway Department. Due to the tightly curved west approach roadway, restricted width and low load carrying capacity, the County is currently replacing this structure.[14] Although the bridge, because of age, fabrication details and location, is of more than usual structural and historical interest, its alignment and size make preservation for recreational purposes or historic record an unlikely alternative.

IV. END NOTES

[1]Christopher J. Schuberth, A View of the Past, An Introduction to Illinois Geology. (Springfield: Illinois State Museum, 1986) pp. 40ff; The Way it Was in Iroquois County, Illinois, 1822-1976. (Watseka: Iroquois County Historical Society, 1976) pp. 2,3.

[2]H. W. Beckwith, History of Iroquois County, Illinois. (Chicago: H. H. Hill and Co., 1880) pp. 383, 390ff; The Way it Was, etc. p. 3; Illustrated Atlas Map of Iroquois County, Illinois. (Edwardsville: W. R. Brink and Co, 1884).

[3]Beckwith, p. 390; Iroquois County Historical Society, Iroquois County History. (Dallas, Texas: Taylor Publishing Co., 1985) p. 206.

[4]Proceedings of the Iroquois County Board of Supervisors Meeting, Iroquois County Times. (Watseka) September 23, 1882.

[5]Proceedings etc., Iroquois County Times. July 14, 1883.

[6]Mendenhall's New Road Map of Illinois. (Cincinnati: C. S. Mendenhall, 1902); Map showing Marked Through Routes in Illinois. (Illinois State Highway Department, February, 1917).

[7]David Plowden, Bridges: The Spans of North America. (New York: Viking Press, 1974) pp. 62, 67.

[8] Illinois Highway Commission Report. (Springfield: State of Illinois, 1906) pp. 55ff.

[9]Victor C. Darnell, Directory of American Bridge Building Companies, 1840-1890. (Washington, D.C.: Society for Industrial Archaeology, 1984), pp. Introduction, 13.

[10]Toledo Critic. (Toledo) February 8, 1902; Toledo Blade. (Toledo) February 7, 1936.

[11]Illinois Department of Transportation, Historic Bridge Survey List. (Springfield: Bureau of Location and Environment, 1992) p. 310lm.1TP; Conversation: David S. Sullivan, Bureau County Engineer, June 10, 1995.

[12]Nomenclature source: Milo S. Ketchum, C.E., Structural Engineers' Handbook. (Chicago: McGraw-Hill, 1924), pp. 140, 676, others. Measurements by author, May 15, 1995, June 9, 1995.

[13]Conversation: Fred Butzow, local resident and great-grandson of H.A. Butzow, May 15, 1995.

[14]Conversations and general information: John C. Devine, Iroquois County Engineer, May 1, 12, 15, 1995.

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B. Maps

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F. Conversations

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G. Schematic Sketch of Butzow Truss

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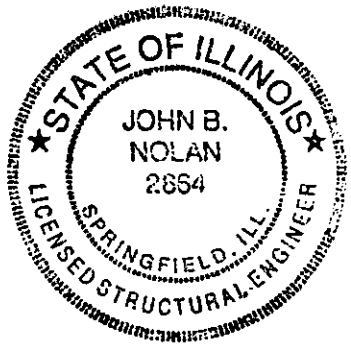
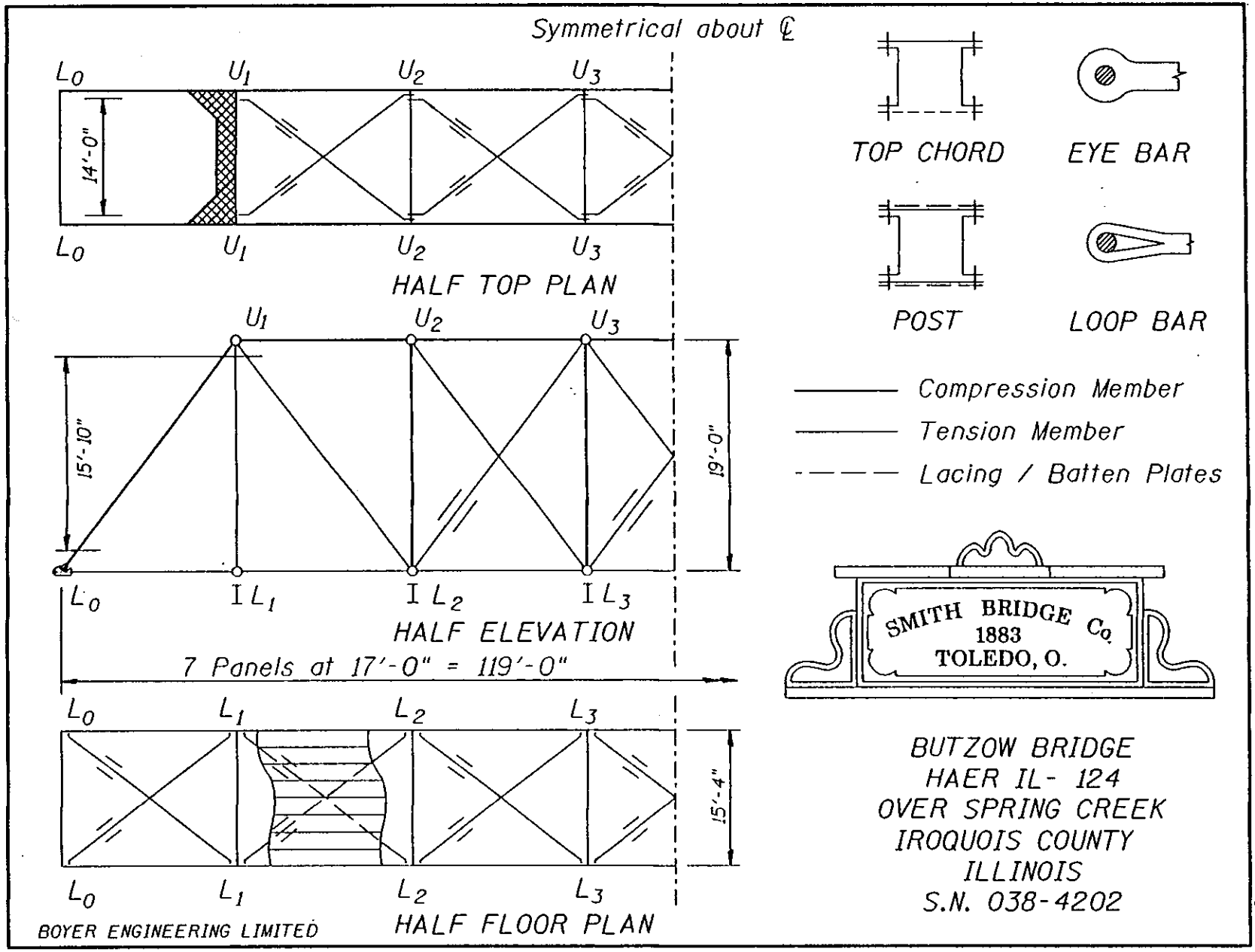
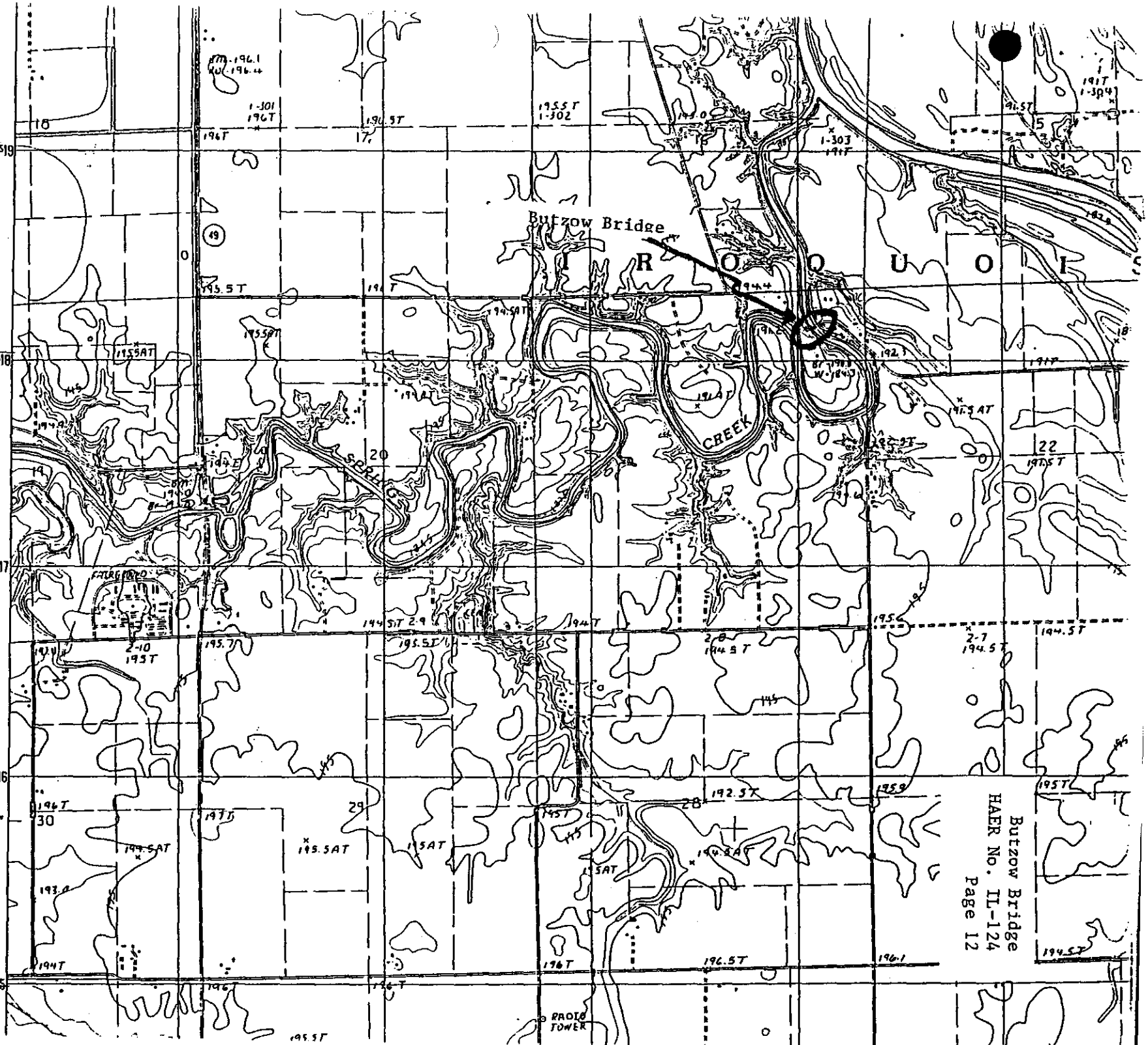
June 21, 1995




Symmetrical about ℄
L0 U1 U2 U3
14'-0"
L0 U1 U2 U3
HALF TOP PLAN
U1 U2 U3
15'-10"
19'-0"
L0 I L1 I L2 I L3
HALF ELEVATION
7 Panels at 17'-0" = 119'-0"
L0 L1 L2 L3
15'-4"
L0 L1 L2 L3
HALF FLOOR PLAN
TOP CHORD
EYE BAR
POST
LOOP BAR
Compression Member
Tension Member
Lacing / Batten Plates
SMITH BRIDGE Co.
1883
TOLEDO, O.
BUTZOW BRIDGE
HAER IL- 124
OVER SPRING CREEK
IROQUOIS COUNTY
ILLINOIS
S.N. 038-4202
BOYER ENGINEERING LIMITED

Crescent City Quad.

7.5 min.



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